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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/085,187 | 02/27/2002 | Joseph A. Kwak | I-2-0203.4US | 3548 |

24374 7590 01/22/2008

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| EXAMINER | |
|---|---|
| RYMAN, DANIEL J | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2616 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 01/22/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/085,187 | KWAK, JOSEPH A. | |
| | Examiner | Art Unit | |
| | Daniel J. Ryman | 2616 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *16 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/16/07; 10/15/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 16 July 2007 has been entered.

### *Response to Arguments*

2. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

### *Information Disclosure Statement*

3. The information disclosure statements filed 16 July 2007 and 15 October 2007 fail to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. They have been placed in the application file, but the information referred to therein has not been considered.

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schramm et al. (USPN 6,208,663), of record, in view of Roobol et al. (USPN 6,301,479) in further view of Dirschedl et al. (USPN 6,262,994), of record, in further view of Hunzinger et al. (USPN 7,164,654), of record, in further view of Dahlman et al. (USPN 6,907,005), of record.

6. Regarding claim 1, Schramm discloses a method for adjusting data modulation at a subscriber unit (col. 5, lines 47-58, where both the mobile station, i.e. "subscriber," and the base station support multiple modulation schemes), comprising: receiving data at a transmitter for transmission (col. 5, lines 59-65, where an LLC frame is received at the transmitter for transmission), wherein the received data is received in data blocks from a higher layer ARQ mechanism (col. 4, line 57-col. 5, line 4, where the system is a GPRS system, and Roobol: col. 2, lines 11-24, which discloses that in GPRS systems the LLC layer is an ARQ protocol in addition to the RLC being an ARQ protocol, such that the RLC layer will receive data in data blocks from a higher layer ARQ mechanism); formatting the received data into packets for transmission, wherein the packets are smaller in size than the data blocks, and each packet having a particular type of encoding/data modulation (Fig. 4(a) and col. 5, lines 59-65, where the LLC is formatted into RLC blocks, where the modulation scheme for transmission of an RLC block changes depending on the circumstances); appending an error check sequence for each packet (Fig. 2 and col. 3, line 16, where each packet has a block check sequence appended thereto); transmitting the packets (col. 5, lines 47-58, where it is inherent that a "transmitting entity" transmits to a "receiving entity"); storing the packets for retransmission in a buffer memory incorporated into the transmitter (col. 7, lines 14-20, where "retriev[ing] the FEC encoded block identified in a negative ARQ acknowledgement from storage" indicates that the packets are stored for

retransmission in a memory incorporated into the transmitter, and where it is implicit, or at the very least strongly suggested, that the storage is a buffer since buffers are storage devices for short-term storage of packets); monitoring a return channel for receipt of an acknowledgment for each packet that that packet has been received (col. 6, lines 60-67, where the receiver "signals [to transmitter] for retransmission of block 40 using any well known ARQ routine" and where Examiner takes official notice that sending acknowledgements for each properly received packet is a "well-known ARQ routine"); retransmitting an original or selectively modified packet at the transmitter (col. 7, lines 14-20, where the system "retrieves the FEC encoded block identified in a negative ARQ acknowledgement from storage" such that an "original or selectively modified packet" is retransmitted), if an acknowledgment for that packet has not been received within a predetermined period of time (where a retransmission is sent upon receipt of a negative ARQ acknowledgement, col. 7, lines 14-17, and where ARQ signaling is performed according to well known ARQ routines, col. 6, lines 60-67, such that a packet is retransmitted if an acknowledgement for that packet has not been received given, as outlined above, that a positive ARQ acknowledgement comprises a ACK signal); collecting retransmission statistics (col. 7, lines 6-9, where the transmitter counts the number of requests for retransmitted blocks, i.e. "collects retransmission statistics"); and adjusting the particular encoding/data modulation using the collected retransmission statistics, wherein if the collected retransmission statistics indicate a low number of retransmissions, a higher capacity encoding/modulation scheme is selected as the particular encoding/data modulation and if the collected retransmission statistics indicate a high number of retransmissions, a lower capacity encoding/data modulation scheme is selected as the particular encoding/data modulation (col. 7, lines 1-9, where if an error rate is high, as indicated

by a high number of requests for retransmission, then the transmitter will select a modulation "designed to have improved noise and/or interference resistance");

Schramm in view of Roobol does not expressly disclose adjusting the particular encoding/data modulation of each packet. Rather Schramm in view of Roobol teaches adjusting the particular encoding/data modulation for only retransmitted packets (Schram: col. 3, line 65-col. 4, line 3). Dirschedl teaches, in a system for adjusting the encoding/data modulation of packets based on error rates, adjusting the particular encoding/data modulation of each packet because this optimizes the data transmission (col. 1, lines 30-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the particular encoding/data modulation for each packet in order to optimize the data transmission.

Schramm in view of Roobol in further view of Dirschedl does not expressly disclose limiting the number of retransmissions to an operator-defined integer value or clearing the buffer memory after the integer value is reached. Hunzinger teaches, in a wireless ARQ system, limiting the number of retransmissions to an operator-defined integer value (col. 7, lines 13-23, where the number of retransmissions sent by a transmitting entity is limited by a MAR value (which is presumably an integer since a transmitter cannot perform a fraction of a retransmission), and col. 11, lines 24-46, where the MAR values are set by the transmitter, which is broadly interpreted to be an "operator" since the transmitter "operates" the system, such that the MAR values are "operator-defined"). Hunzinger does this to minimize latency created by the continued re-transmission of messages (col. 7, lines 54-62). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to limit the number of

retransmissions to an operator-defined integer value to minimize latency created by the continued re-transmission of messages.

Hunzinger further discloses that the number of retransmissions may be limited by the amount of memory available (col. 11, lines 29-32), which suggests that available memory space should be maximized whenever possible. It is implicit that packets whose integer value has been reached are "superfluous" since the packet will never be transmitted. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to clear the memory of packets whose integer value has been reached to maximize the amount of memory space available for other retransmissions.

Schramm in view of Roobol in further view of Dirschedl in further view of Hunzinger does not expressly disclose combining the retransmitted original or selectively modified packet with the transmitted packets. Dahlman teaches, in a wireless ARQ system, combining the retransmitted original or selectively modified packet with the transmitted packets to make the ARQ scheme more robust (col. 8, lines 26-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the retransmitted original or selectively modified packet with the transmitted packets to make the ARQ scheme more robust.

7. Regarding claim 2, Schramm in view of Roobol in further view of Dirschedl in further view of Hunzinger in further view of Dahlman discloses that the particular type of encoding/data modulation is forward error correction (FEC) (Schramm: col. 5, lines 47-58, where FEC varies in addition to or independent of modulation).

8. Regarding claim 4, Schramm in view of Roobol in further view of Dirschedl in further view of Hunzinger in further view of Dahlman suggests that the packets are transmitted using a

single carrier having a frequency domain equalization (SC-FDE) air interface (Schramm: col. 4, lines 49-56, where the invention is usable in FDMA systems and any hybrids thereof).

9. Regarding claim 5, Schramm in view of Roobol in further view of Dirschedl in further view of Hunzinger in further view of Dahlman discloses that return channel is a fast feedback channel (Schramm: col. 6, lines 60-67, where the TDM control channel provided for signaling for retransmission is, as broadly defined, a "fast feedback channel" since the control channel is devoted to signaling for retransmission) when the packets are transmitted using a code division multiple access (CDMA) air interface (Schramm: col. 4, lines 49-56, where the invention is usable in CDMA systems).

10. Regarding claim 6, Schramm in view of Roobol in further view of Dirschedl in further view of Hunzinger in further view of Dahlman discloses identifying a packet as having an unacceptable error rate responsive to receipt of a negative acknowledgment (Schramm: col. 7, lines 14-20).

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schramm et al. (USPN 6,208,663), of record, in view of Roobol et al. (USPN 6,301,479) in further view of Dirschedl et al. (USPN 6,262,994), of record, in further view of Hunzinger et al. (USPN 7,164,654), of record, in further view of Dahlman et al. (USPN 6,907,005), of record, as applied to claim 2 above, and further in view of Barton (USPN 6,499,246), of record.

12. Regarding claim 3, Schramm in view of Roobol in further view of Dirschedl in further view of Hunzinger in further view of Dahlman does not expressly disclose that the packets are transmitted using an orthogonal frequency division multiple access (OFDMA) air interface and the FEC encoding/data modulation adjusting is performed in addition to selective nulling of

subchannels in an OFDMA set. However, Schramm in view of Roobol in further view of Dirschedl in further view of Hunzinger in further view of Dahlman does disclose that the system can be used in a variety of types of access methodologies (Schramm: col. 4, lines 49-56). Barton teaches, in a wireless system employing FEC (col. 8, line 64-col. 9, line 3), that OFDM "is well-known in the industry...[as] an effective means of mitigating Intersymbol Interference (ISI)" (col. 1, lines 29-34). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use an OFDMA system in order to mitigate Intersymbol Interference. Barton also teaches that it is well known to null subchannels in an OFDM system in order to lower PAR (col. 11, lines 34-38). Examiner notes that Applicant does not specifically define "nulling of subchannels" in the claim such that Examiner is free to interpret "nulling of subchannels" in any manner, as long as the interpretation is reasonable. It would have been obvious to one of ordinary skill in the art at the time of the invention to perform FEC encoding/data modulation adjusting in addition to selective nulling of subchannels in an OFDMA set in order to perform data correction (FEC) and lower PAR (selective nulling) in an OFDMA system.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (571)272-3152. The examiner can normally be reached on Mon.-Fri. 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571)272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Daniel J. Ryman
Examiner
Art Unit 2616

Daniel Ryman